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EXAMINER

MOORE, KARLA A

ART UNIT

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1792

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/787,037 | <b>Applicant(s)</b><br>SUGIYAMA, AKIRA |  |
|                              | <b>Examiner</b><br>KARLA MOORE       | <b>Art Unit</b><br>1792                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>0508</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-6, 8-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,406,590 to Ebata et al. in view of U.S. Patent No. 5,948,165 to Tamura.

3. Ebata et al. disclose a plasma processing apparatus generating plasma under atmospheric pressure for processing an object (J) substantially as claimed in Figure 9, for example, and comprising: first (6) and second (5) electrodes adjacent to each facing a surface of the object to be processed; a dielectric (5 and 18) having a first opposing surface positioned spaced apart from the surface of the object between the object and said first electrode and a second opposing surface positioned between the object and said second electrode, and completely filled between said first and second electrodes; gas supplying means (1) provided through the inside of only the first electrode of said first and second electrodes and having a supply opening (2) formed in said first opposing surface for supplying a processing gas to the surface of the object through said supply opening; and gas exhausting means (4) provided inside said second electrode having an exhaust opening (2) formed in said second opposing

surface for exhausting the processing gas supplied to the surface of the object through said exhaust opening.

4. While Ebata et al. do disclose the gas supplying means specifically as claimed, Ebata does not appear to disclose the gas exhausting means exactly as claimed. That is, although the exhaust opening of the vacuum exhausting means is provided through the inside of the second electrode, the gas exhausting means is not provided through only the inside of the second electrode of said first and second electrodes. The provision of the gas exhausting means only in the second electrode basically amounts to a change in shape of the gas exhausting means. The courts have ruled that selections of shape are a matter of choice which a person of ordinary skill in the art will find obvious absent persuasive evidence that the particular configuration of the claimed shape was significant. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

5. It would have been obvious to one of ordinary skill in the art exercising ordinary creativity, common sense and logic that the gas exhausting means of Ebata et al. could also be shaped such that it was provided through the inside of only the second electrode of said first and second electrodes.

6. However, Ebata et al. fail to teach the first and second electrodes having coated surfaces and said dielectric covering said coated surfaces.

7. Tamura teaches the provision of an intermediate layer between an electrode and a dielectric for the purpose of joining the electrode and the dielectric and for the purpose of providing a material having extendability for absorbing thermal deformation of either of the two (abstract).

8. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an intermediate coating layer on the electrode surfaces and between the dielectric and the electrode in order to join the electrode and the dielectric and in order to provide a material extendability for absorbing thermal deformation of either of the two as taught by Tamura.
9. With respect to claim 3, in Figures 9 and 10, Ebata et al. teach providing around said gas supplying means and said gas exhausting means, an inner wall formed of a dielectric material is provided.
10. With respect to claim 4, as the surfaces of the dielectric extends on a plane parallel to the surface of the object, so too would a coating provided thereon.
11. With respect to claims 5, during an intended use of the apparatus, an electric line of force connecting said first and second electrodes when a voltage is applied between said first and second electrodes would extend above and substantially parallel to the surface of the object. However, it is also noted that the courts have ruled that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).
12. With respect to claim 6, said supply opening and said exhaust opening are provided in a vicinity of a region positioned between said first opening surface and said second opposing surface.
13. With respect to claim 8, said supply opening and said exhaust opening are formed to have a slit-shape in one direction or formed as a plurality of pores arranged in one direction.

14. With respect to claim 9, Ebata et al. teach that a gap (D) between the electrodes (5 and 6) and the stage (T) supporting the object is sufficiently small such that the gas supplied into the processing region is unlikely to flow into atmosphere (i.e. not be discharged through the gas exhausting means), such that the processing region is necessarily held at a high pressure (Figure 4; column 17, rows 17-52; column 19, rows 56-59); thereby suggesting that it is ideal for any gas supplied into the processing region gas supplying means be exhausted from the processing region by the gas exhausting means, rather than any other means. Therefore, the desirability of the claimed feature would have been obvious to one of ordinary skill in the art exercising ordinary creativity, common sense and logic. In that connection, the courts have ruled that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

15. With respect to claim 10, although specific relationships between the positions of the electrodes with respect to the positions of the supply and exhaust openings are not explicitly taught in Ebata et al, it is taught that the number and position of the supply openings and exhaust openings can be tailored as needed (e.g. Ebata et al. column 28, rows 55-62). Further, as noted above, the courts have ruled that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

16. With respect to claim 12, Ebata et al. teach that the first electrode is surrounded by the second electrode, it would have been obvious to one of ordinary skill in the art

exercising ordinary creativity, common sense and logic that the surrounding electrode could be provided as a single electrode or a plurality of electrodes and still possess the same processing capabilities, with the resulting apparatus being formed in symmetry with respect to the second electrode. The courts have ruled that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

17. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,406,590 to Ebata et al. in view of U.S. Patent No. 5,948,165 to Tamura and U.S. Patent Publication No. 20030213561 to Selwyn et al.

18. Ebata et al. disclose a plasma processing apparatus generating plasma under atmospheric pressure for processing an object (1) substantially as claimed in Figure 9 and comprising: first (6) and second (5) electrodes adjacent to each facing a surface of the object to be processed; a dielectric (5 and 18) having a first opposing surface positioned spaced apart from the surface of the object between the object and said first electrode and a second opposing surface positioned between the object and said second electrode, and completely filled between said first and second electrodes; gas supplying means (3) having a supply opening (4) formed in said first opposing surface for supplying a processing gas to the surface of the object through said supply opening; and gas exhausting means (1) provided inside said second electrode having an exhaust opening (2) formed in said second opposing surface for exhausting the processing gas supplied to the surface of the object through said exhaust opening.

19. However, Ebata et al. fail to teach the first and second electrodes having coated surfaces.

20. Tamura teaches the provision of an intermediate layer between an electrode and a dielectric for the purpose of joining the electrode and the dielectric and for the purpose of providing a material having extendability for absorbing thermal deformation of either of the two (abstract).

21. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an intermediate coating layer on the electrode surfaces and between the dielectric and the electrode in order to join the electrode and the dielectric and in order to provide a material extendability for absorbing thermal deformation of either of the two as taught by Tamura.

22. With respect to the recitation of the exhaust opening being located "at" the recessed portion of the second opposing surface. It is noted that this recitation only necessitates that the exhaust opening be provide near a recessed portion provided in the second opposing surface. As in Ebata et al. the exhaust opening is provided at a central location of the apparatus, it can be said to be near any other portion of the apparatus.

23. Ebata et al. and Tamura disclose the plasma processing apparatus substantially as claimed and as described above.

24. However, Ebata et al. and Tamura fail to disclose said dielectric covering the electrode includes a recessed portion formed such that distance from the surface of the object to said second opposing surface is made larger than distance from the surface of the object to said first opposing surface.



25. Selwyn et al. teach the provision of recesses (grooves) of varied placement, number, size and shape, as desired, on the surface of an electrode for the purpose of controlling the density, or aggressiveness of plasma chemistry (e.g. abstract and paragraphs 45, 48, 61).

26. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided recesses (grooves) of varied placement, number, size and shape, as desired, on the surface of the dielectric covered electrode of Ebata et al. in order to electrode in order to control the density, or aggressiveness of plasma chemistry as taught by Selwyn et al.

24. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebata et al. and Tamura as applied to claims 1, 3-6, 8-10 and 12 above, and further in view of U.S. Patent No. 5,198,724 to Koinuma et al.

25. Ebata et al. and Tamura disclose the plasma processing apparatus substantially as claimed and as described above.

26. However, Ebata et al. and Tamura fail to teach an apparatus further comprising a grounded conductive cover provided to cover externally exposed surfaces of said first and second electrodes.

27. Koinuma et al. teach providing a grounded conductive cover (Figure 2, 23 and 28) to cover externally exposed surfaces of first and second electrodes of a plasma processing apparatus. The cover is provided for the purpose of encasing the body of the plasma processing apparatus (see column 5, rows 26-32).

### ***Response to Arguments***

28. Applicant's arguments with respect to claims 1 and 3-12 have been considered but are moot in view of the new ground(s) of rejection and/or are not persuasive as discussed below.

29. Regarding Applicant's arguments regarding the provision of the gas supplying means and gas exhausting means in the first and second electrodes respectively, as described above, such a provision basically amounts to a changed in shape. While it may be true that such a provision can be an advantage if unreacted plasma gas remains in the gas exhausting means of the second electrode, Ebata et al. include a provision for (column 21, row 53 through column 22, row 3; power absorber) ensuring that unreacted gas is not converted into plasma. Given this provision in Ebata et al., the claimed gas supplying means and gas exhausting means can be considered equivalent to the gas supplying and gas exhausting means of Ebata et al. The courts have further ruled that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

30. Applicant also argues that the combining the teachings of Tamura with those of Ebata would not be obvious to one of ordinary skill in the art. In response to this argument, Examiner notes that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references

would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Tamura fairly teaches the provision of an intermediate layer between an electrode and a dielectric for the purpose of joining the electrode and the dielectric and for the purpose of providing a material having extendability for absorbing thermal deformation of either of the two. One of ordinary skill in the art exercising ordinary creativity, common sense and logic would understand the advantage of such a provision in Ebata et al.

31. With respect to the further arguments provided for claims 3-6 and 8-12, these arguments are again drawn to the perceived allowability of claim 1 over the relied upon prior art. Any additional arguments with respect to these dependent claims only appear to be general allegations that these claims define a patentable invention without specifically pointing out how the language of these claims patentably distinguishes them from the references.

32. With respect to claim 9, Applicant further argues that Ebata et al. discloses the use of an additional unnumbered gas discharge device in Figure 1; however, as described above, Ebata et al. discloses that it is ideal to use a singular gas discharging device, which shown in Figure 1 connected to gas exhausting means. Examiner does not see the additional gas discharging device of which Applicant has written in Figure 1.

33. With respect to claim 10, as described above, in Ebata et al, it is taught that the number and position of the supply openings and exhaust openings can be tailored as needed (e.g. Ebata et al. column 28, rows 55-62). Further, as noted above, the courts have ruled that where the general conditions of a claim are disclosed in the prior art, it is

not inventive to discover the optimum or workable ranges by routine experimentation.

In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

34. With respect to the arguments against the combination of Selwyn with the other relied upon art in the rejection of claim 7, it is noted that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, Selwyn fairly suggests the desirability of providing recesses (grooves) of varied placement, number, size and shape, as desired, on the surface of an electrode for the purpose of controlling the density, or aggressiveness of plasma chemistry. One of ordinary skill in the art exercising ordinary creativity, common sense and logic would understand the advantage of such a provision in the electrodes of Ebata et al.

35. With respect to the further arguments provided for claim 11, these arguments are again drawn to the perceived allowability of claim 1 over the relied upon prior art, which is addressed above.

### ***Conclusion***

36. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARLA MOORE whose telephone number is (571)272-1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karla Moore/  
Primary Examiner, Art Unit 1792  
20 July 2008